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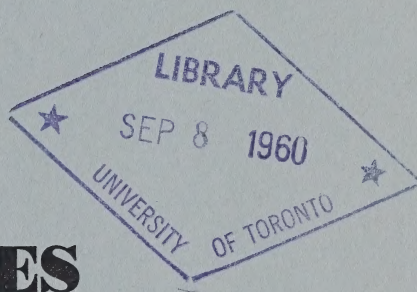
Canada
Department of Mines
and Technical Surveys



Report of the

EXPLOSIVES

DIVISION



Calendar Year
1959



Canada
Department of Mines
and Technical Surveys

Report of the

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DIVISION

Calendar Year 1959

by
H. P. Kimbell
Chief Inspector



Canada
Department of State
and Technical Services

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THE QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1960


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C O N T E N T S

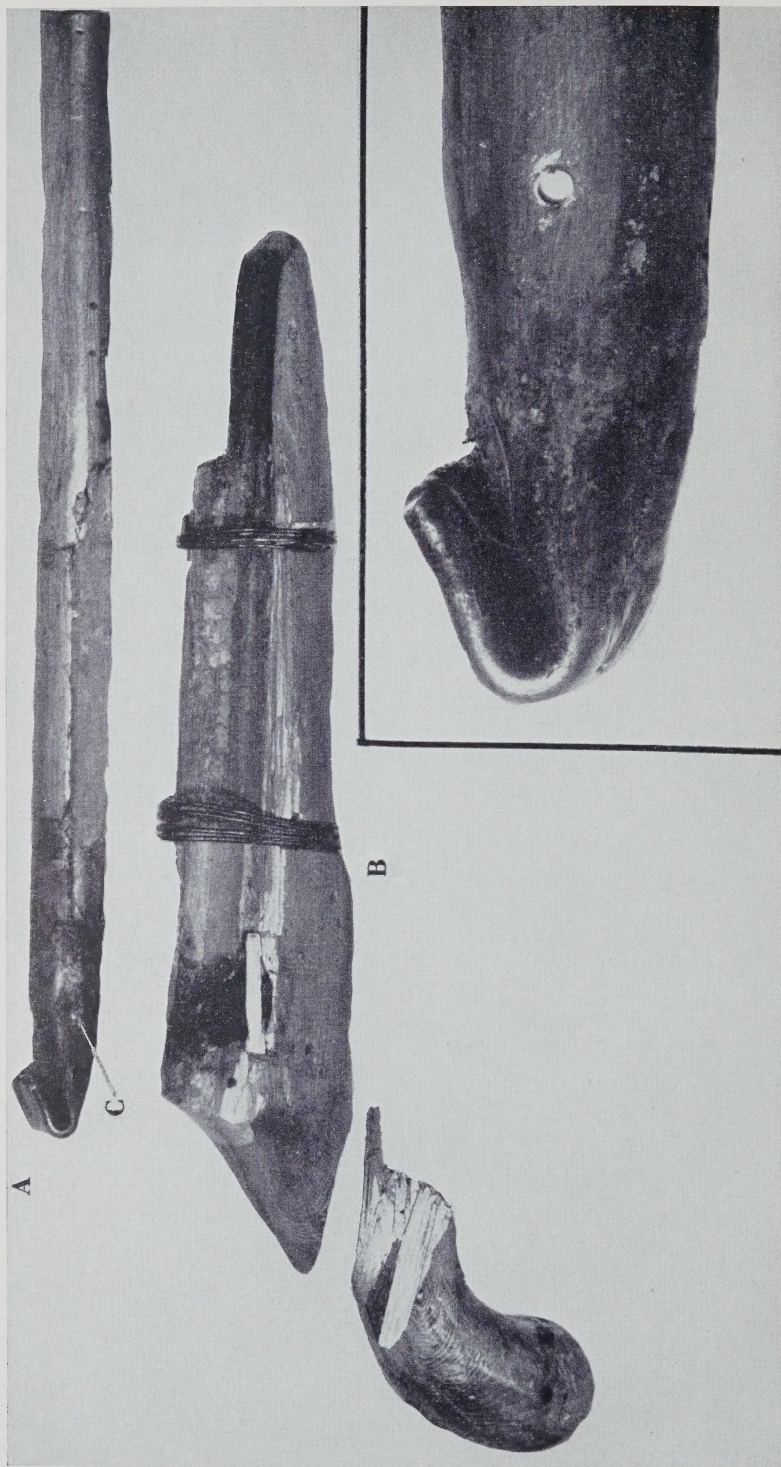
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Remains of a home-made 'gun' constructed by three teen-aged boys.

The brass pipe A was attached with wire to the stock B and loaded with home-made gunpowder. A fuse was inserted through hole C, and lit. To anyone with even a passing familiarity with weapons, it was a foregone conclusion that a dangerous and probably fatal accident would occur from using an explosive in such a device. As it was, the explosion projected the pipe backwards, penetrating two inches into the temple of the boy holding the gun. Miraculously, he is still alive. (This accident is No. 4-10 in Appx. C, Part II.)

In 1959 two boys were killed and fourteen injured in accidents involving home-made explosives.

The Explosives Division exists solely in the interest of public safety. Its function is to administer the Explosives Act which, by a system of licences and permits supported by inspection, controls the manufacture, authorization, sale, storage, and importation of explosives, as well as transportation of explosives by road.

Offices and Staff

The Division's main office is in the Mines Branch building, 555 Booth Street, Ottawa; branch offices are maintained at 739 West Hastings Street, Vancouver, British Columbia and at 7 Terminal Road, Halifax, Nova Scotia. Advice regarding the Explosives Act may be obtained at any of these offices but all applications for factory and magazine licences, certificates for registered premises, and permits to import and transport explosives should be addressed to the Chief Inspector of Explosives, Department of Mines and Technical Surveys, 555 Booth Street, Ottawa 1.

There were no staff changes during the year but in April the administration of the Explosives Laboratory was transferred to the Mines Branch. This enlarged the scope of the laboratory and made it possible to take full advantage of its staff and facilities. Although the laboratory still performs the work required under the Act, the change has nominally reduced the Division's staff to sixteen—an inspectorate of six and a clerical staff of ten.

Ammonium Nitrate Blended With Fuel Oil

There was further expansion in the use of this field-mixed explosive during the year. Permission to blend ammonium nitrate with fuel oil was given to 45 additional applicants, bringing the total to 197 since the *Ammonium Nitrate and Fuel Oil Order* was passed on March 14, 1957.

Two interesting developments in 1959 resulted in exploratory visits to the United States by an officer of the Division with technical personnel of Canadian Industries Limited. The first, which applies only to users of very large quantities of the nitrate-oil, is really an explosives-mixing plant on wheels known as the 'Baughman Truck'. Ammonium nitrate and fuel oil are transported in separate compartments on the vehicle and are blended continuously, fluidized with air

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and metered directly to the collar of the drillhole through a flexible hose. Permission for trial use, specifying appropriate safety precautions, was given to a contractor engaged in extensive excavation work in the construction of a dock in Quebec.

The other innovation is known as the Atlas 'Jetloder'. As the name indicates this is a device for loading the nitrate-oil under air pressure. It makes possible the bulk loading, with good density, of horizontal holes. No application to use this device was received until early 1960, but permission, with appropriate safeguards, has now been given to an open-pit mine operator in Nova Scotia. Of course, in all such instances involving mining operations, permission is also required from the provincial mining authority.

It is interesting to speculate on this new trend in explosives manufacture—the trend based on sensitizing relatively inert ammonium nitrate rather than on reducing the sensitivity of nitroglycerine to a safe and practical degree, as in dynamite. Much research is being conducted and a symposium on this subject, sponsored by the University of Missouri School of Mines and Metallurgy and the United States Bureau of Mines, was attended by an officer of the Division. There may well emerge an over-all gain on the side of safety but a warning at this stage is timely. Although the ammonium-nitrate-based mixtures are variously termed in the trade as 'blasting agents' and 'nitro-carbo-nitrates', they are all explosives within the meaning of the Act and are therefore subject to its requirements unless special exemption is provided.

Manufacture

Production of commercial blasting explosives rose to 158,050,000 pounds from 147,750,000 pounds in 1958 but is still below the 1957 peak of 169,492,000 pounds. These figures take no account of ammonium nitrate and fuel oil blended at the site of use; accuracy here is not possible but it is estimated that ammonium nitrate used in this manner during the year was well in excess of 20,000,000 pounds.

The list of licensed factories (Appendix A) shows a very interesting addition for 1959—the factory of Iron Ore Company of Canada at Schefferville, Quebec. It is the first in Canada to be established and operated by an explosives user on his own property and for his own exclusive purposes. A factory for blending ammonium nitrate with fuel oil, it also represents a significant development in the expanding use of this relatively insensitive explosive.

A small fireworks factory came into production at Orangeville, Ontario under the name Safety Flares and Fireworks Limited. Since spring, it has been engaged in the manufacture of highway flares.

Authorization and Testing

During the year 229 samples were received and examined by the laboratory as follows:

Commercial Blasting Explosives	
(a) for authorization.....	27
(b) factory run-of-work.....	30
Fireworks	
(a) for authorization.....	80
(b) factory run-of-work.....	37
Small-arms Ammunition.....	34
Blasting Accessories.....	3
Accident Investigations.....	4
For other Government Departments.....	11
Miscellaneous.....	3

The samples "for other Government Departments" represent assistance in assessing hazards of handling and transporting explosives and other dangerous goods. Chiefly involved are the Department of National Defence, the Post Office Department, and the RCMP.

Forty-five shipments of Chinese firecrackers were sampled and tested by the RCMP at the port of Vancouver.

A complete list of explosives authorized for manufacture and importation is given as Appendix D.

Licences, Permits and Certificates

The following were issued during the year; 1958 figures are in parentheses:

Factory Licences.....	20	(19)
Magazine Licences (storage for sale).....	471	(438)
Temporary Magazine Licences (storage for private use).....	1,019	(1,032)
Registered Premises Certificates (storage of small quantities for sale).....	98	(100)
General Importation Permits (one shipment only).....	1,421	(1,357)
Annual Importation Permits.....	59	(40)
Transportation Permits (by road).....	300	(265)

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Imports

Explosives imported during the year are detailed in Appendix B. The large quantity described as "for other manufacturing purposes" is mainly nitrocellulose used in the manufacture of lacquers, coated fabrics and films. The phrase "for use in explosives factories" describes, in the main, explosives used as components of commercial products and for which there are no Canadian manufacturing facilities. This applies to smokeless powder for small-arms ammunition, trinitrotoluene, and pentaerythrite tetranitrate.

Inspections

Shown below is the number of inspections carried out during the year including those by Deputy Inspectors of Explosives of the RCMP; 1958 figures are in parentheses:

Factories.....	51	(39)
Magazines.....	2,444	(2,129)
Registered Premises.....	170	(159)
Transportation.....	143	(81)
Storage in Unlicensed Premises.....	194	(156)

Thefts

Reported thefts of explosives numbered 23 compared with 32 in 1958; quantities stolen totalled 2,512 pounds of dynamite and 11,261 detonators. Most thefts were from licensed magazines and were accomplished by forcing the padlocks. Necessary isolation of magazines tends to defeat security and this points up the need for affixing door hardware with bolts, not screws, and the use of a good grade of lock. Inspectors also recommend shielding padlocks with steel hoods or using a special locking device for which drawings are supplied.

There is no doubt that some thefts are perpetrated for the criminal use of explosives, but others appear to be acts of sheer bravado or vandalism. Detonators stolen from a magazine near Vancouver were later wantonly abandoned where children found them; fortunately there was no accident. In another instance seven young men were convicted under the Criminal Code for breaking, entering and theft of 150 pounds of dynamite, 500 detonators and a roll of safety fuse.

Theft of 4,000 detonators from a coal-mining magazine in Nova Scotia was no doubt associated with illegal mining activity.

Four of the year's thefts were committed by juveniles. One 15-year-old boy was killed in a rocket experiment wherein a detonator stolen from a Quebec quarry magazine was used as a propellant.

An unusual theft involved removal of 5 pounds of dynamite from a loaded drillhole on a road-construction project. It is of course a criminal offence to leave loaded holes unguarded; an appropriate warning was delivered to a provincial department of highways.

Abandoned Explosives

Most reports of explosives found abandoned come through the RCMP. During the year there were 47 reports involving 7,245 pounds of dynamite and 1,298 detonators. Seventeen of the owners were discovered and eight were punished by prosecution. A quantity of 4,000 pounds of deteriorated explosives of a grade used in geophysical exploration was found abandoned and unprotected in a relatively uninhabited part of Alberta; the Division circularized a warning to all companies engaged in seismic operations. In most instances small quantities were involved though this does not lessen the seriousness of the offence.

Not all abandonment cases are deliberate—for example small surplus quantities of explosives remaining after a job is finished, that are cached for future use and forgotten. In one instance children found 45 detonators in the drawer of a sewing machine; fortunately there was no accident. But the same cannot be said in two other cases where juveniles tampered with detonators and were injured. Such accidents could not happen if every user of explosives regarded each detonator as a potential child-crippler.

A glaring example of the truth of the adage that 'familiarity breeds contempt' was discovered by police during a search of an automobile for liquor. There were three sticks of dynamite and eight detonators in the glove compartment. The driver proved to be a licensed blaster and said he had put the explosives there 15 days before and had forgotten them.

Destruction of Explosives

Quantities of explosives destroyed during the year were unusually high, totalling 284,212 pounds of blasting explosives and 4,693 detonators. These figures include most of the abandoned explosives reported above and also explosives rendered unusable by deterioration or damage. The latter include two reports worthy of note. One concerns the destruction of 150,400 pounds nitroglycerine explosives which were to be used on a construction project. The explosives had been stored in magazines without adequate ventilation and their destruction became necessary when work on the project was deferred. The other report involved a large part of the explosives cargo of a vessel which ran aground at Havre St. Pierre, Quebec. In this case, 115,000 pounds of blasting explosives and 171,000 feet of safety fuse became damaged by water and had to be destroyed.

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Prosecutions

It is the general policy of the Division to educate and warn rather than prosecute. Nevertheless, 28 violations resulted in court action during the year. This compares with 44 in 1958 and 33 in 1957. Convictions were obtained in all 28 cases. Offences were as follows:

Act, Section 5(4) (storage without licence).....	3
Regulations, Part VI (illegal transportation).....	7
Regulations, Part XIII (illegal storage of small quantities)....	18

In spite of the ever-mounting death toll on the highways there is still carelessness in moving explosives on public roads. The seven transportation offences in 1959 for which court action was taken include: deliberate violation of terms of explosives transportation permit by carrying larger loads than allowed; dynamite and detonators not safely separated; failure to carry a fire extinguisher; exceeding the 40 mph speed limit; failure to display "EXPLOSIVES" warning signs; and abandonment of an automobile with dynamite and detonators lying on the back seat. Fines imposed ranged up to \$150.

Many of the storage violations involved small quantities of explosives; but it is frequently such small quantities, carelessly or insecurely stored by the casual user, that result in accident. The law requires that any quantity, however small, must be stored in substantial detached buildings or receptacles—one for dynamite and one for detonators—kept exclusively for the purpose, and safely located and marked "EXPLOSIVES". A magazine licence is required for storage of more than 150 pounds of dynamite and 2,000 detonators.

The most severe fine for improper storage was \$400 and costs; it was imposed on a contractor in Ontario who certainly should have known the hazards of his neglect. The fine covered four offences: no "EXPLOSIVES" sign, door unlocked, magazine not clean nor free from grit, and no licence.

Reports were also received of six prosecutions under the Criminal Code for offences involving explosives. In one instance four Quebec youths were sentenced to penitentiary for breaking and entering a magazine and setting it afire. The magazine and contents, 450 pounds of dynamite, were totally destroyed. A case reported in detail last year, involving extreme carelessness in transportation, was brought to a conclusion by conviction and a fine of \$1,000. A contractor had loaded explosives on a vehicle whose exhaust system was designed to heat the platform; the load caught fire and detonated. A civil action for damages will be costly in this case.

Accidents

The statistics in Appendix C, Part I show fewer accidents in 1959 than in 1958 but the figures still leave very much to be desired. Reported accidents from all causes totalled 109, compared to 123 in 1958 and 111 in 1957.

—In Use

(1959) 66 accidents, 13 killed, 70 injured

(1958) 73 accidents, 15 killed, 90 injured

The federal Explosives Act has no control over the using of explosives which is a provincial responsibility. The cause analysis in Appendix C indicates that more than *one third* of “in use” accidents—adding together causes c, d, and o—resulted from failure to take adequate precautions against the effects of an expected detonation. *One quarter* of the total were caused by drilling into explosives left from previous blasts. These facts reflect the importance of the messages outlined in the series of warning posters published in 1956 by Canadian Industries Limited. Four of the titles were:

The Best Protection from Flying Debris is Distance

Guard Every Possible Approach to a Blast

Carefully Wash Down and Examine the Face Before Drilling

Don't Gamble by Drilling into Bootlegs . . . They May be Loaded

—In Manufacture

(1959) 3 accidents, 1 killed, 2 injured

(1958) 6 accidents, 1 killed, 8 injured

The year was marred by a fatal accident at the Cooksville, Ontario factory of T. W. Hand Fireworks Company Limited. On August 18, a small building licensed for the filling and pressing of star pellets was blown apart by a low-order explosion. The only person in the building was a press operator who was severely burned and died in hospital two weeks later. He was unable to make a statement but evidence showed that the ignition originated in the air-driven press and flashed to all explosives in the building, estimated as 8 pounds of star composition and gunpowder. The heavy press was displaced and fell on the operator, preventing quick escape. The investigating inspector's recommendations are summarized as follows:

- (1) A chlorate should not be used as an ingredient of pyrotechnic compositions when a substitute is satisfactory.
- (2) Presses and other such equipment must be suitably supported to prevent displacement in the event of accident.

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- (3) Presses must be shielded and operated by remote control.
- (4) Bulk composition necessary to the press operation must be protected against communication of ignition from a press flash.

On May 25, one person was injured in an accident at the Brownsburg, Quebec factory of Canadian Industries Limited. He suffered burns, mostly first-degree, to his face, neck, arms and hands. Eight ounces of a deflagrating composition flashed during filling of electric detonators. Suspecting improper charging, the operator had entered the charger guard carrying a brass tool. It is believed that an inadvertent action resulted in impact sufficient to ignite the explosive.

The third accident, during manufacture of safety cartridges, resulted in minor injury only.

—In Storage

(1959) 1 accident, no casualties

(1958) No accidents

One of the infrequent accidents of this type was reported in 1959. An unlicensed magazine used in logging operations in British Columbia blew up with its contents of 1,000 pounds of dynamite. The blast totally destroyed the building and left a crater 3 feet deep. Fortunately the magazine was properly isolated and there were no casualties. The explosion was investigated by a Deputy Inspector of Explosives of the RCMP but its cause was not determined. The owner suspected a rifle shot and this appears the most likely cause.

This incident points up the need for bullet-resistant construction of magazines. In frame buildings this is accomplished by double walls filled with sand. Plans of bullet-resistant magazines are contained in "The Storage of Explosives", a booklet distributed by the Division; suggested plans of magazines are also available from explosives manufacturers.

—In Transportation by Road

(1959) 9 accidents, no casualties

(1958) 5 accidents, no casualties

Nearly 21,000 trucks were involved in highway accidents in Ontario during 1959. The nine explosives accidents confirm that explosives-laden vehicles are not immune from inclusion in these general statistics, in spite of the extra precautions incumbent on explosives drivers. An accident involving a dynamite-bearing truck always entails the extra hazard of detonation and disaster. Unlike rail movement, truck transport has no private right-of-way, and the explosive

cargo on a truck is near a supply of gasoline or diesel fuel. The Division's pamphlet "A Warning about Trucking Explosives" is still being distributed and is being copied by the Construction Safety Association of Ontario.

Most of the nine mishaps were reported by holders of explosives-transportation permits; such reports are required by the Regulations. No doubt there were other accidents, unreported, involving vehicles carrying small quantities and therefore not required to be licensed under the Act. Four of the reported incidents resulted in the ditching of trucks carrying 10,000-pound loads. In one of these an icy road was the cause; in another it was concluded that the driver fell asleep momentarily and lost control. Two collisions were reported—one resulting from icy conditions and the other from what appeared to be an error of judgment in passing another vehicle.

A truck loaded with nearly 25,000 pounds of explosives was completely destroyed by fire, without detonation, during transportation on a private mining road near Port McNeill on Vancouver Island. This report was received near the end of the year and while complete details were not available, the law was obviously disregarded, as the maximum quantity which may be carried in one load is 10,000 pounds. Prosecution may well eventuate.

Because it could certainly happen in Canada, reference must be made to the disaster in the State of Oregon in August, where a vehicle loaded with 6½ tons of explosives caught fire and detonated. The truck was parked within the town of Roseburg, and the blast resulted in death for 13 persons, injuries for 125 others, and millions of dollars in property damage. A detailed and illustrated report is given by the National Board of Fire Underwriters, New York, entitled "The Roseburg, Oregon, Fire, Explosion and Conflagration". This report is recommended reading for all provincial and local authorities dealing with highway traffic and fire protection and prevention. It refers to the difficulty of complete and adequate enforcement of federal regulations governing explosives and dangerous goods, and the consequent need for enactment and cooperative enforcement of laws at more local levels.

—In Misuse

(1959) 27 accidents, 4 killed, 34 injured

(1958) 35 accidents, 3 killed, 50 injured

Accidents due to misuse, briefly detailed in Appendix C, Part II, are a particular concern of the Division. Nearly all those resulting from tampering with detonators and other commercial explosives would be prevented if the security requirements of the Regulations were carefully observed. In 1959 only five accidents—a record low—were caused by misuse of detonators; this compares with an average of twelve for each of the previous ten years. It is hoped

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this improvement will persist; certainly the Division will continue to warn users, and to promote the education of juveniles on the nature and hazards of explosives. The Division is indebted to the federal Department of Health and Welfare for publishing the pamphlet "Hazards of Explosives to Children and Teenagers", in the September issue of *Canada's Health and Welfare*, and indeed for making explosives hazards the theme of that issue. A reprint of the article is being widely distributed by the Division under the title "Explosives—A Continuing Danger".

One of the eight fireworks accidents merits special comment, not only because it caused two deaths but because it involved careless or thoughtless—and illegal—storage conditions. A serious fire was caused when fireworks, on open display in a drug store near Montreal, became ignited by a lighted firecracker thrown within the store. The significant words are 'open display'. The Explosives Regulations, Part XII, provide that up to 50 pounds of fireworks "may be kept for sale or display *in a box, glass case or other suitable receptacle . . .*". It is vital to protect a stock of fireworks from careless smokers or thoughtless mischief-makers. Because retail outlets are so numerous, it is impossible for the Division to enforce this Section of the Regulations without the cooperation of local authorities; in fact such authorities would do well to enact their own bylaws in this matter.

This sort of fire—caused by fireworks kept on open display by retailers—is by no means without precedent. A similar fire occurred in Regina immediately preceding the May 24th celebrations. This one was said to have been started when fireworks were ignited by a customer's cigarette or match; the fire resulted in costly damage but no casualties. Fireworks must burn to give pleasure but uncontrolled combustion can be disastrous! T. W. Hand Fireworks Company Limited have agreed to include a printed warning with the advertising kits distributed to retailers.

Experiments with home-made explosives continue to take a toll. Two were killed and nine injured in attempting to make and launch rockets, and another five were hurt in assembling 'bombs' or 'guns'. In some instances the injuries were serious. Nearly all involved teen-aged youths but one adult was hospitalized for a month from severe burns sustained while preparing a rocket fuel. The previously mentioned pamphlet "Explosives—A Continuing Danger" refers to the serious hazards inherent in home-made explosives.

APPENDICES

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APPENDIX A

Factories Licensed to Manufacture Explosives, 1959

Owner	Location of Factory	General Nature of Product
Canadian Industries Limited	Beloeil, Que.....	Blasting explosives, black powders, nitro-compounds
Canadian Industries Limited	James Island, B.C....	Blasting explosives
Canadian Industries Limited	Nobel, Ont.....	Blasting explosives
Canadian Industries Limited	Brainerd, Man.....	Blasting explosives
Canadian Industries Limited	Brownsburg, Que....	Ammunition, detonators, blasting accessories, fusees, railway torpedoes
Canadian Industries Limited	Calgary, Alta.....	Blasting explosives
Canadian Safety Fuse Company Limited	Brownsburg, Que....	Safety fuse, detonating fuse, blasting accessories
Canadian Arsenals Limited	St. Paul l'Ermite, Que.....	Filling military shells and fuzes
Canadian Arsenals Limited	Valcartier, Que.....	Filling military small-arms ammunition
Canadian Arsenals Limited	Valleyfield, Que.....	Military explosives, propellants
Du Pont of Canada Limited	North Bay, Ont.....	Blasting explosives
Cyanamid of Canada Limited	Niagara Falls, Ont....	Nitroguanidine
T. W. Hand Fireworks Co. Limited	Cooksville, Ont.....	Fireworks and military pyrotechnics
T. W. Hand Fireworks Co. Limited	Papineauville, Que....	Fireworks and military pyrotechnics
Croname (Canada) Limited	Waterloo, Que.....	Toy pistol caps
Montreal Fireworks Displays and Manufacturing Company Limited....	Ville La Salle, Que....	Display fireworks
W. F. Bishop & Son Limited	Unionville, Ont.....	Fireworks
Superior Toy Ltd.....	Dundas, Ont.....	Toy pistol caps
Safety Flares & Fireworks Limited	Orangeville, Ont.....	Highway fusees
Iron Ore Company of Canada	Schefferville, Que....	Ammonium nitrate-fuel oil

APPENDIX B

Explosives Imported into Canada, 1959

Class	Division	Description	Quantity
I		Gunpowder	78,370 lb.
III		Nitro compounds:—	
	1	Nitroglycerine explosives	289,800 lb.
	2	Propellants	194,775 lb.
	2	For use in explosives factories	5,683,178 lb.
	2	For other manufacturing purposes	4,660,805 lb.
V	1	Fulminates	1,177 lb.
VI	1	Primers	597,952
	1	Safety fuse	5,105 ft.
	1	Safety cartridges	22,948,448 rounds
	2	Detonating fuse	126,900 ft.
	2	Seismic explosives	76,000 lb.
	3	Detonators	92,973
		Miscellaneous	52,193 lb.
VII	2	Manufactured fireworks	1,257,040 lb.

Part I—Accidents Involving Explosives, 1959

Circumstances or Cause	Mines and Quarries			Elsewhere			Total		
	Acci- dents	Killed	In- jured	Acci- dents	Killed	In- jured	Acci- dents	Killed	In- jured
In Use									
a Delaying too long in lighting fuse....	3	1	3				3	1	3
b Premature firing of electrical blasts...									
c Not taking proper cover.....	8	1	7	3		3	11	1	10
d Projected debris.....	2		2	5	3	2	7	3	4
e Returning too soon after blasting.....	7	1	7				7	1	7
f Improper handling of misfires.....									
g Rough tamping.....	1		2	1		2	2		4
h Ignition of explosives by flames, sparks, etc.....				1	2		1	2	
i Drilling into explosives.....	12		17	4	2	5	16	2	22
j Striking unexploded charge in remov- ing debris.....	1		1				1		1
k Preparing charges.....	1		1	3		3	4		4
l Using too short a fuse.....									
m Insufficient ventilation after blasting.	1	2	1				1	2	1
n Springing shots.....									
o Inadequate guarding.....	6		7				6		7
p Various.....	5	1	5	2		2	7	1	7
Total.....	47	6	53	19	7	17	66*	13	70
In Manufacturing.....							3	1	2
In Storage.....							1		
In Transportation (by road).....							9		
Total.....							13	1	2
In Misuse									
(a) Detonators.....							5		9
(b) Other explosives.....							1		3
(c) Fireworks.....							8	2	8
(d) Home-made explosives.....							13	2	14
Total.....							27†	4	34
Miscellaneous.....							3†	3	2
Total all circumstances.....	47	6	53	19	7	17	109	21	108

* Occurred in circumstances not directly controlled by the Act.

† Brief descriptions are given on the following pages.

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APPENDIX C

Part II—Misuse of Explosives

Ref. No.	Cause of Accident	Killed	Injured
<i>(a) Detonators</i>			
12-3	A 16-year-old boy had parts of the thumb and index finger of his right hand amputated following injuries received when a blasting cap exploded in his hand. The youth found a number of detonators in a dump. The owner had attempted to destroy some detonators by burning them in an open fire on the dump, but had failed to ensure that all had detonated.....		1
24-4	Four juveniles were injured, one seriously, when one of six detonators they found was set off with a lighted match. Five sticks of dynamite were also found by the children. The explosives were discovered in a toilet at a local park.....		4
26-4	A 12-year-old boy touched the ends of an electric detonator to a small battery. In the explosion that followed he lost two fingers and suffered injuries to a third. Detonators had been left unsecured in his house by a former roomer. The latter pleaded guilty to a charge of breach of duty under the Criminal Code; he received a two-year suspended sentence....		1
1-8	A 9-year-old boy lost the tips of three fingers of his right hand when a detonator exploded. The boy found a bottle containing some aged detonators on a shelf in an unlocked shed.....		1
7-8	Two children attached an electric detonator to a storage battery. In the resulting explosion one child lost the sight of her right eye and the other suffered serious injuries to his eyes and hands. Explosives were apparently taken from an unsecured shack at a gravel pit.....		2
<i>(b) Other Explosives</i>			
7-1	Three young boys were burned on the face and hands when they ignited two small bags of gunpowder they found in a ditch.....		3
<i>(c) Fireworks</i>			
19-5	A 12-year-old boy sustained an eye injury when unauthorized fireworks, imported illegally, were exploded by a friend. The fireworks had escaped Customs attention in private baggage.....		1
24-5	Two 12-year-old boys were burned while playing with fireworks. One received minor burns and the other sustained severe leg burns when fireworks in his pocket accidentally ignited.....		2
25-5	Two youths lost their lives in a fire initiated by fireworks on open display in a drug store; one boy tossed a small lighted firecracker to scare his companion; it set off the entire stock causing a serious conflagration...	2	
16-10	One boy suffered eye burns when a lighted firecracker was thrown into his face.....		1
17-10	A juvenile was injured when the explosion of a firecracker set in a wooden pen-holder blew splinters and powder into his left eye.....		1

Part II—Misuse of Explosives—continued

Ref. No.	Cause of Accident	Killed	Injured
(c) Fireworks—concluded			
18-10	A boy was burned on the face when a firecracker exploded as he was lighting it.....		1
11-11	A 13-year-old boy was injured when he was examining a firecracker which had failed to explode and it went off unexpectedly.....		1
16-11	A 10-year-old boy was burned about the legs when firecrackers in his pocket ignited.....		1
(d) Home-made Explosives			
16-1	A 16-year-old youth was hospitalized with a severely injured left hand after an explosion in his home. The blast occurred while he was mixing rocket fuel		1
18-1	A home-made rocket exploded as an 18-year-old youth was bending over it. He was hospitalized with burns to his eyes, face and legs and may suffer permanent damage to his sight.....		1
14-2	A 15-year-old boy was accidentally killed by a home-made rocket which he fabricated with a metal pipe, a pencil and an electric detonator. The contraption was activated by a flashlight battery.....	1	
2-5	Several boys were attempting to launch a home-made rocket by applying a lighted match to a pipe filled with an explosive. The 'rocket' exploded resulting in the loss of a finger to one of the boys.....		1
11-5	A 15-year-old boy mixing chemicals for a rocket struck a tube of explosive mixture with a hammer causing it to explode. He lost the thumb and two fingers of his left hand; his companion was injured by flying metal.		2
20-5	A 26-year-old man was hospitalized for a month with severe burns to his face following the detonation of an explosive mixture. He and some juveniles had been trying to make a rocket propellant with chemical ingredients.....		1
12-9	Three boys were injured when a crude rocket made from railway torpedoes and flares exploded in a backyard.....		3
4-10	A 17-year-old youth assembled a home-made pistol with a wooden stock and a brass tube closed at one end. When he loaded the 'barrel' with a gun-powder mixture and inserted a fuse through a small hole, the device 'discharged' with disastrous results. The tube was driven two inches into his head.....		1
7-11	A 16-year-old student was killed while experimenting with a home-made rocket fuel in the basement of his home.....	1	
8-1	A marble was fired from a home-made toy cannon and lodged half an inch above the right eye of a 15-year-old boy. He underwent an operation for removal of the missile. The marble was fired from a copper 'barrel' in which firecrackers had been rammed and ignited.....		1

Explosives Division

Part II—Misuse of Explosives—concluded

Ref. No.	Cause of Accident	Killed	Injured
	<i>(d) Home-made Explosives—concluded</i>		
13-4	A 14-year-old boy was hospitalized with serious facial injuries following an explosion at his home. The youth was manufacturing a bomb said to have been made from ingredients of a junior chemistry set.....		1
5-5	A 15-year-old youth was making a bomb in the kitchen of his home when it blew up. He lost his left thumb and two fingers. He was pouring the home-made powder into a pipe and tamping it down with a steel rod.....		1
15-5	A 17-year-old youth suffered permanent injuries to his right hand from the explosion of a home-made bomb constructed of a metal pipe containing gunpowder and a firecracker.....		1
	<i>Miscellaneous</i>		
	Three cases of suicide by means of explosives were reported; three persons were killed and two injured.....	3	2

Authorized Explosives

Manufactured in Canada

Canadian Industries Limited (Ammunition Division) Montreal, Que.

Ammunition
Detonators and Electric Detonators
Dextrinated Lead Azide
Highway Flares
Igniter Cord Electric Starter
Lead Salt
Lead Styphnate (Normal)
MS Detonating Relay
Percussion Caps
Railway Fusees
Railway Track Signals
Styphnic Acid
"Sureshot" Booster
Tetrazene

Canadian Industries Limited (Explosives Division) Montreal, Que.

Amex
Amite
Ammonia Dynamite—20, 25, 30, 35, 40, 50 and 60 per cent
Ammonia Dynamite, Agricultural—60 per cent (for export only)
Ammonia Dynamite Extra—40, 50, 60 and 70 per cent (for export only)
Ammonia Dynamite, Free Running—40 and 65 per cent
Ammonia Dynamite, High Density—20, 25, 30, 35, 40, 50 and 60 per cent (for export only)
Ammonia Dynamite, Low Density—20, 25, 30, 35, 40, 50, 55 and 60 per cent (for export only)
Ammonia Dynamite, Quarrying—60 per cent
Ammonia Dynamite, Seismograph—60 per cent (for export only)
Ammonia Dynamite, Stumping—20 per cent (for export only)
Ammonia Gelatin—30, 35, 40, 50, 60, 75, 80 and 90 per cent (for export only)
Black Blasting Powder
Blastol—60 per cent
BRX-7—75 per cent
Cilgel-B and Cilgel-C—70 per cent
C.I.L. Dynamite—Nos. 3 and 5
C-X-L Dynamite—No. 5
C-X-L Gelatin—Nos. 1 and 2
C-X-L-ite
Detonating Fuse Primer
Ditching Dynamite—50 per cent
Driftite-D—70 per cent
Dygel—75 per cent
Dynamex—40, 50, 60 and 70 per cent
Excel-G, Excel-S, and Excel GW—75 per cent
Explosives BL-100, BL-112, BL-114, BL-115, BL-116, BL-120, BL-122, BL-123, BL-125, BL-128, BL-129, BL-130, and BL-131
Forcite—30, 35, 40, 50, 60, 75, 80 and 90 per cent
Fuse Powders—35, 40, 44, 53 and 65 seconds
Gelatin Dough—90 per cent
Geogel

Explosives Division

Manufactured in Canada—continued

Canadian Industries Limited (Explosives Division) Montreal, Que.—continued

Giant Gelatin—30, 35, 40, 50, 60, 75, 80 and 90 per cent
Guhr Dynamite
Guncotton
Gunpowder
Hi-Velocity Gelatin—40, 60, 75 and 80 per cent
Hydromex and Hydromex-D
Liquid Nitroglycerine
Monobel—Nos. 4, 6, 7, 10, 11, 14 and X(EQ.S.)
Nitrocotton
Nitrone—S-1, T-1, T-3 and T-4
Nitrone Primer and Nitrone S-1 Primer
Nitropel
Nitrox
Polar Stumping Powder—20 per cent
Primers—Pentolite, Pento-Lok and Pento-Mex
Pyromex
Seismic Gelatin—60 per cent (for export only)
Semi-Gelatin—Nos. 1, 2, 3, 4 and 5 (for export only)
S.N.G.
Stopeite—20, 25, 30, 35, 40, 50, 55 and 60 per cent
Straight Gelatin—25, 30, 35, 40, 50, 60, 75, 80 and 90 per cent (for export only)
Submagel—40, 50, 60, 75, 80 and 95 per cent
Trinitrotoluene
Vibrex—60 per cent

Canadian Safety Fuse Company Limited, Brownsburg, Que.

Detonating fuse—"B-Line", "Primacord"
Hot Wire Fuse Lighters
Igniter Cord—"Thermalite" brand, types A and B
Igniter Cord Connectors—"Thermalite" brand
Safety Fuse

Cyanamid of Canada Limited, Niagara Falls, Ont.

Nitroguanidine

DuPont of Canada Limited, Montreal, Que.

DuPont Ditching Dynamite
DuPont Extra—Nos. 1, 2, 3, 4 and 5
DuPont Gelatin—25, 40, 50, 60 and 75 per cent
DuPont Stumping Dynamite
Energex—40, 50 and 60 per cent
Energex FR—25, 40 and 65 per cent
Energite—40, 50 and 60 per cent
Gelex-A—1, 2 and 3
Gypsal—Nos. 1 and 2
Hi-Velocity Gelatin—40, 60 and 75 per cent
NBL-101, NBL-102, NBL-201, NBL-301, NBL-302, NBL-304, and NBL-402
Nilite FR
Pelletol—Nos. 1 and 2
Pentolite Primer
Semi-Gelatin No. 1

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Manufactured in Canada—concluded

DuPont of Canada Limited, Montreal, Que.—concluded

Special Gelatin—30, 35, 40, 50, 60, 75, 80 and 90 per cent
Submarine Hi-Velocity Gelatin—60 and 80 per cent
Tovex

Pursuant to Section 8 of the Act, ammonium nitrate blended with fuel oil is an authorized explosive.

Manufactured by Foreign Firms

Aeromet Engineering Corporation, Azusa, California

Aeroplex AK14 Propellant

Aktiebolaget Bofors, Nobelkrut, Bofors, Sweden

Smokeless Sporting Powder
Detonating Fuse, (Bofors type)

American Cyanamid Co., Latrobe, Pennsylvania

Fulminate of Mercury
Detonators

Atlas Diesel Co., Stockholm, Sweden

Engine Starting Cartridges

Atlas Powder Co., Wilmington, Delaware

Atlas Gelatin—60 and 75 per cent
Atlas RXL-198
Detonators
Giant Gelatin—40, 60 and 75 per cent
Giant Gelatin, High Velocity—60 per cent
Shaped Charges
Subgel A

Austin Powder Co., Cleveland, Ohio

Ammonia Dynamite—AL-4 and 60 per cent
Apcomite 20-A
Austinite—Nos. 15, 20 and 21
Black Pellet Powder
Detonating Fuse
Primers—Pentolite, ANP-16 Amatol and ANP-16 Sodium Amatol

Leon Beaux & Co., Societa Italiana Munizioni, Milan, Italy

Small Arms Ammunition

Bermite Powder Co., Saugus, California

Baker Powder Charge
Firing Head Igniter

Cardox Corporation, Chicago, Illinois

Cardox
Cardox Heaters

Explosives Division

Manufactured by Foreign Firms—continued

Cartoucherie Française, Paris, France

Primers and Primed Cases
Small Arms Ammunition

Cascade Cartridge Co., Lewiston, Idaho

Primers

De Kruithoorn N.V. Nederlandsche Jachtpatroonfabriek, 'sHertogenbosch, Holland

Shotgun Shells—12, 16, 20 gauge

Deutsche Jagdpatronenfabrik G.M.B.H. 14 (b) Rottweil a.N. West Germany

Shotgun Cartridges

E.I. DuPont de Nemours & Company, Inc., Wilmington, Delaware

Auxiliary Charges C. 63
Black Fuse Powder
Detonators and Electric Detonators
DuPont Bulk Powder
DuPont Ditching—50 per cent
DuPont Extra—A, C, E, F, and G
DuPont Gelatin—25, 40, 50, 60 and 75 per cent
DuPont Pistol Powder No. 6
Elcord Delay Unit
Explosive Rivets
Fulminate of Mercury
F.N.H. Ground Smokeless Powder
Gelex—Nos. 1, 2 and 3
Hi-Velocity Gelatin—40, 60 and 75 per cent
Improved Military Rifle Powders
Jet Tappers
Nitramon—A, 2, and S
Nitramon Primer and Nitramon S Primer
Nitramex—2 and 2H
Nitramite
Nitramite Primer
Nitrocellulose
Nitrostarch
Oil Well Explosives—S.O.W.E. No. 1 and EL-431-A
Open Hole Shaped Charges (R.D.X. or Pentolite)
P.6 Seismograph Booster
Pelletol—Nos. 1 and 2
Perforating Shaped Charges (R.D.X. or Pentolite)
Pentaerythritol Tetranitrate
Plastic Primer
“Primacord” Booster
“Primacord” MS Connector
Pyro (ground smokeless) Powder
Red Cross Extra—40, 50 and 60 per cent
Red Cross Extra (H.W.R.)—40, 50 and 60 per cent
Sheet Explosive EL-506A
Smokeless Powders
Special Gelatin—30, 40, 50, 60, 75, 80 and 90 per cent
Special Primer with Booster (4 × 7.5 lb.)

Report for 1959

Manufactured by Foreign Firms—continued

E.I. DuPont de Nemours & Company, Inc., Wilmington, Delaware—concluded

- Sporting Rifle Powders
- Submarine Hi-Velocity Gelatin—60 and 80 per cent
- Tetryl
- Waterproof Booster C.66

Dynamit-Actien-Gesellschaft, Nurenberg, Germany

- Delay Connector
- Detonators and Electric Detonators
- Detonating Fuse “Nobel Cord”
- R.W.S. Rimfire Cartridges

Ellefsens Tendskruefabrikk, Stokke, Norway

- Time Fuses and Detonators for Whaling Guns

EM-GE Sportgerate K-G Gerstenberger & Co., Wurttemberg, Germany

- Blank Cartridges

Ensign Bickford Company, Simsbury, Connecticut

- Detonating Fuse
- Ignitacord
- Igniter Cup
- Lead Spitter

ETS. Brandt, La Ferte St. Aubin (Loiret), France

- Shaped Charges—3 $\frac{3}{8}$ - and 5-inch

ETS. Billant, Usine Du Prado, Bourges 9 (Cher), France

- Shaped Charges—3 $\frac{3}{8}$ -inch

Federal Cartridge Corporation, Minneapolis, Minnesota

- Shotgun Cartridges

Federal Laboratories, Pittsburgh, Pennsylvania

- Lachrymatory Cartridges
- Powder Loads

Gevelot, S.A., 50 Rue Ampere, Paris, France

- Shotgun Cartridges

Giulio Focchi, Lecco, Italy

- Power Tool Cartridges, Q 4
- Primers and Percussion Caps
- Safety Cartridges, Cal 9 mm short and 7.63 mm Mauser
- Shotgun Cartridges, 12 gauge and 24 gauge

Go Oil Well Services Inc., Fort Worth, Texas

- Jet Perforators

Greenwood & Batley Ltd., Leeds, England

- Shotgun Cartridges

Explosives Division

Manufactured by Foreign Firms—continued

Gustav Genschow & Co., A.G., Hamburg, Germany

Shotgun Cartridges, "Express" brand

Safety Cartridges, "Geco" brand—6.35 mm, 7.65 mm and 9 mm

Haerens Ammunition Arsenals, Denmark

Safety Cartridges, 6.5 mm × 55

Hercules Powder Company, Wilmington, Delaware

Detonators and Electric Detonators

Gelatin Oil Well Explosive

Explosive E.P. 172-1 and 2

Gelamite D

Gelatin Extra—40 and 60 per cent

High Pressure Gelatin—60 per cent

Nitrocellulose

Smokeless Powders

Vibro Caps

Vibrogel B and 3

Hirtenberger Patronen, A.G., Hirtenberg, Austria

Primers and Primed Cases

Small Arms Ammunition

Hull Cartridge Co., Hull, Yorkshire, England

Shotgun Cartridges, 12 gauge

Imperial Chemical Industries Limited, England

Black Sporting Powders—FG, FFG, FFFG, and NFFFG

Black Whaling Powder

Cerium Low Tension Fusehead

Detonating Relay

Detonators and Electric Detonators

Gunpowder—G-7, G-12, G-20, SFG-12 and SFG-20

Pentaerythritol Tetranitrate

Percussion Caps

Safety Cartridges

Saluting Powder

Smokeless Powders

Smokeless Whaling Charges

Tetryl

Intermountain Research & Engineering Co. Inc., Salt Lake City, Utah

Procore 3C Booster

Jet Guns Company, Fort Worth, Texas

Shaped Charges—1 $\frac{3}{4}$ - and 2 $\frac{3}{8}$ -inch

Glass Gun Perforating Charges—G.G. 2, G.G. 4, and G.G. 7

K. & G. Oil Tool & Service Co. Inc., Houston, Texas

Junk Shot

Manufactured by Foreign Firms—continued
Kemode Manufacturing Co. Inc., New York, N.Y.

“Quik-Shot” Cartridges

Kilgore Incorporated, Westerville, Ohio

Flashlight Cartridges
Powder Loads

King Powder Co., Cincinnati, Ohio

Black Pellet Powder

Lake Erie Chemical Co., Cleveland, Ohio

Lachrymatory Cartridges

Lane-Wells Co., Los Angeles, California

Gun Perforator Cartridges

Mid Continent Torpedo Co. Ltd., Tulsa, Oklahoma

Red Head Firing Heads

M. McKinley Co., Bellaire (Greater Houston), Texas

Shells SP—Nos. 51, 70 and 100

Nitroglycerin Aktiebolaget, Gytting, Sweden

Shotgun Tracer Cartridges

A.B. Norma Projektilfabrik, Amotfors, Sweden

Safety Cartridges

Olin Mathieson Chemical Corp., East Alton, Illinois

Cyclonite
Detonators and Electric Detonators
Kiln Gun Shells
Linemen's Flare Lights
Normal Lead Styphnate
Railway Fusees
Railway Torpedoes
Smokeless Powder
Western Small Arms Ammunition
Winchester Small Arms Ammunition

T. Page-Wood Limited, Bristol, England

Safety Cartridges

Patronenfabrik, A.G., Solothurn, Switzerland

Safety Cartridges, 7.5 mm

Perforating Guns Atlas Corporation, Houston, Texas

Jet Perforating Charges

Explosives Division

Manufactured by Foreign Firms—concluded

Petroleum Tool Research Inc., Fort Worth, Texas

Detonator Assembly

Vibro-shot Charge Assembly

Poudreries Nationales, France

D-2 Propellant Powder

Poudreries Royale De Wetteren "Cooppal & Cie, S.A.", Brussels, Belgium

Shotgun Cartridges

Pringle Powder Company, Bradford, Pennsylvania

Liquid Nitroglycerine

Remington Arms Co. Inc., Bridgeport, Connecticut

Stud Driver Cartridges

Remington Small Arms Ammunition

Peters Small Arms Ammunition

Springfield Small Arms Ammunition

Rey Freres, Paris, France

Detonators and Electric Detonators

Detonating Fuse, Plastex and Duplex

Safety Cartridges

Safety Fuse—TT, and TR

F. J. Roberts Squib Company, Punxsutawney, Pennsylvania

Miners' Safety Squibs

Rohm-Gesellschaft, Sontheim/Brenz, Kreis Heidenheim, Germany

Blank Cartridges

Signal Cartridges

Karl Schermer and Co., Karlsruhe, West Germany

Animal Stunner Cartridges

Shaped Charge Explosive Manufacturers, Inc., Martinsburg, West Virginia

Plurajet Blasting Units (not for underground use)

Standard Railway Fusee Corporation, Boonton, New Jersey

Railway Torpedoes

Temple Cox Development Co. Ltd., Bromley, Kent, England

Animal Stunner Cartridges

Trojan Powder Company, Allentown, Pennsylvania

Nitrostarch

Trojan—40 per cent S, 50 per cent S, ESX, ESX-LD, PT-3X, and TL-501-B

Winchester Arms Company, Cleveland, Ohio

"Tempotool" Cartridges

Authorized Fireworks

Canadian Manufacturers

W. F. Bishop & Son Limited, Toronto, Ont.
Canadian Industries Limited, Montreal, Que.
Canadian Safety Fuse Company Limited, Brownsburg, Que.
Croname (Canada) Ltd., Waterloo, Que.
Dominion Fireworks Co. Ltd., Dixie, Ont.
T. W. Hand Fireworks Co. Limited, Cooksville, Ont. and Papineauville, Que.
Safety Flares and Fireworks Limited, Orangeville, Ont.
Montreal Fireworks Displays and Manufacturing Company, Ville La Salle, Que.
Superior Toy Ltd., Dundas, Ont.

Foreign Manufacturers (certain fireworks authorized*)

Acme Fireworks Corporation (Acme Novelty Manufacturing Company), River Grove, Illinois
Aerial Products Incorporated, Merrick, Long Island, New York
American Railway Signal Company, Fostoria, Ohio
Anthes Force Oiler Company, Fort Madison, Iowa
Astra Fireworks Ltd., London, England
Atlas Fireworks Co. Inc., Los Angeles, California
M. Backes' Sons Inc., Wallingford, Connecticut
E. Benjaminsson, Falu Pyrotekniska Industri, Falun, Sweden
J.G.W. Berckholtz, Hamburg-Bahrenfeld, Germany
Hermann Bischoff, Bremen, Germany
Oswald Bradley Ltd., Southport, Lancs., England
C. T. Brock & Co., Hemel Hempstead, Herts., England
Brookside Pyrotechnic & Chemical Co., Elkton, Maryland
Bryant & May Ltd., London, England
Contimetal Industry (Hemel Hempstead) Ltd., Hemel Hempstead, Herts., England
EM-GE Sportgerate K-G Gerstenberger Co., Wurttemberg, Germany
Exportvertrieb Pyrotechnik, Hamburg, Germany
J. Halpern Co., Pittsburgh, Pennsylvania (Distributors for Lenover Corporation, Chester, Pa. and Lenover, Pa.)
Thos. Hammond & Company, Craigmillar, Edinburgh, Scotland
Haley & Weller Ltd., London, England
Hitt Fireworks Company Limited, Seattle, Washington
Hudson Fireworks Display Company, Hudson, Ohio
Illinois Fireworks Co., Danville, Illinois
Interstate Fireworks Manufacturing and Display Company, Bridgewater, Massachusetts
Japan Fireworks Trading Company Ltd., Tokyo, Japan
Jatina Manufacturing Co. Inc., Mount Vernon, New York
Keystone Fireworks Manufacturing Co. Inc., Dunbar, Pennsylvania
Kilgore Incorporated, Westerville, Ohio
Lakeside Railway Fusee Company, South Beloit, Illinois
Lenover Corporation, Chester, Pa., and Lenover, Pa. (J. Halpern, Pittsburgh, Pa., Distributors)
Oscar Lunig, Stuttgart-Mohringen, Germany
Marutamaya Ogatsu Fireworks Co., Tokyo, Japan
C. Schauer Nachfolger, Berlin, Germany
National Fireworks Incorporated, West Hanover, Massachusetts
New Jersey Fireworks Mfg. Co. Inc., Elkton, Maryland
Norsk Sprengstoffindustri-A/S, Nittedal, Norway
S.V. Olsen, Valby Tingsted, 10 Kobenhavn VBY, Denmark

Explosives Division

Foreign Manufacturers (certain fireworks authorized)*—concluded

Olin Mathieson Chemical Corporation, New Haven, Connecticut
N.V. Pyro, Klazienaveen, Holland
Pyro-Chemie (Hermann Weber & Co.) Eitorf/Sieg, West Germany
Pyrotechnischen Fabriken, Wuppertal-Ronadorf, Germany
Pyrowerk, Hamburg-Newgraben, Germany
Reliance Snap Company, Bishop's Stortford, Herts., England
Richard Appel's Jo King, New York, N.Y.
Saburo Inagaki, Okazaki City, Japan
Saburo Ishibashi, Tokyo, Japan
Schermully Pistol Rocket Apparatus Ltd., Newdigate, Surrey, England
Schiebeler & Co., Hamburg, Germany
Standard Fireworks Limited, Huddersfield, England
Standard Railway Fusee Corporation, Boonton, New Jersey
Stehling and Co., Hamburg, Germany
The J. & E. Stevens Sales Co., New York, N.Y.
Superior Signal Co., Incorporated, South River, New Jersey
United Fireworks Manufacturing Company, Dayton, Ohio
U.S. Fish and Wildlife Service, Pocatello, Idaho
Van Karner Chemical Arms Corporation, New York, N.Y.
Messrs. Wacco Ltd., High Post, Salisbury, England
Joseph Wells & Sons Limited, Dartford, Kent, England
Joh. Chr. Wendt, Hamburg, Gr. Borstal, Germany
Wischo-K.G. Wilsker Co., Erlangen, West Germany
Wunderkerzen-Werk Carl Flemming, Hamburg-Neugraben, Germany
Yuki Node, Shimazuma-Machi, Makabe-Gun Ibaragi-Perfection, Japan

Chinese firecrackers with gunpowder composition and not exceeding 4 inches in length and $\frac{9}{16}$ inch in diameter, and small Chinese fireworks, are authorized when found to function satisfactorily on examination at port of entry.

* A list of authorized fireworks is on file in the office of the Explosives Division. Information may be obtained on request.

